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RECORD OF ORAL HEARING

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ERIC MONTFORT, CEDRIC SALENC,
XAVIER ROSER and LOIC GAUDIC

Appeal 2009-003764
Application 10/687,585
Technology Center 3600

Oral Hearing Held: September 10, 2009

Before LINDA E. HORNER, JOHN C. KERINS, and STEVEN MCCARTHY, *Administrative Patent Judges.*

ON BEHALF OF THE APPELLANT:

FALK EWERS, ESQUIRE
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The above-entitled matter came on for hearing on Thursday, September 10, 2009, commencing at 9:33 a.m., at the U.S. Patent and Trademark Office, 600 Dulany Street, Alexandria, Virginia, before Dawn A. Brown, Notary Public.

PROCEEDINGS

THE USHER: Calendar Number 25, Mr. Ewers.

JUDGE HORNER: Good morning.

MR. EWERS: Good morning, Your Honors.

JUDGE HORNER: How are you?

MR. EWERS: I'm fine, thanks.

JUDGE HORNER: We've had a chance to review your case. And you have 20 minutes. Please proceed when you're ready.

MR. EWERS: Thank you.

Yeah. First I would like to introduce myself. My name is Falk Ewers, and I am from Sughrue Mion. I saw a couple of our colleagues here today. I represent Alcatel in this appeal. The Appeal Number is 2009-003764.

And this case involves a geostationary satellite. A geostationary satellite system is known in the art as a satellite which has a fixed position relative to the earth and which moves with the movement of the earth.

And the invention was an attitude control system which tries to control the attitude of this geostationary satellite because a satellite is typically influenced by disturbances. So it can change the attitude. To keep it in the position, you have this attitude control system.

The satellite is actually depicted in figure 1. You see in figure 1 the body of the satellite and the solar generators or solar panels 12 and 14, and you'll see the control system in figure 3.

I would like first –

JUDGE MCCARTHY: Counsel, is there anything about figure 1 that would tell us whether or not the solar panels 12 and 14 are a fixed length or if they're perhaps a variable length deployable?

MR. EWERS: Exactly. That is the first issue. This comes from the dependent claims 15 and 16 where it is claimed. And this claim language is really broad. It says that the solar panels have a fixed length.
As you can see in the drawing, there is no indication that these panels are moving or something, so if they have a fixed length, then a person of ordinary skill in the art, like this pen, would know that this pen is a fixed length.
So generally solar panels have a fixed length. They do not change the length.
And all parts of the satellite are a fixed length. So that is why I don't see a written-description problem, which you are referring to.

JUDGE MCCARTHY: Would a deployable solar panel be considered a solar panel of fixed length?

MR. EWERS: Yes. Because the invention as -- in the claim, we have the language that they are deployed, and the invention is applied to the deployed solar panels. There is nothing about deploying them, so it is related to these solar panels once they are deployed.
It is clear when you send the satellite to its orbit, then these solar panels are in a different shape because they are unfolded in the orbit.
But they still have a fixed length. So the length of the solar panels doesn't change, and this is met by claims 15 and 16.
And, yeah, as I said, I don't see a written description -- I'm repeating myself now -- problem here. It is not exactly in the specification mentioned a length of 14 inches or something. That is not necessary because a person of ordinary skill in the art would -- like this pen would know that this element has a fixed

length which does not change.

JUDGE KERINS: Counsel, are there known in the art any solar panels that would have other than a fixed length?

MR. EWERS: Not that I know. I would have to go into --

JUDGE KERINS: So you would say the industry standard is fixed-length solar panels?

MR. EWERS: Under this interpretation, which I told you a person of ordinary skill in the art would understand that, yeah, this panel would interpret this as a fixed length.

JUDGE MCCARTHY: And if I understand correctly, these solar panels or whatever other device you may have extending from the main body of the satellite have certain flexible modes with which they might vibrate in response to certain stimuli.

MR. EWERS: Correct. If you take a look at the Specification, the flexible modes are, for example, defined on page 5, and these flexible modes describe oscillations of low frequency and low attitude. And these solar panels have these flexible modes, correct.

JUDGE KERINS: Counsel, on page 5 does it identify the modes or are you just saying the definition of flexible modes is any oscillation at a low frequency?

MR. EWERS: Well, low frequency and -- these oscillations of low frequency with the most high energetic content. So the oscillations can have different energies. This is another aspect. And this invention is concerned with the low frequencies and the most energetic of these low frequencies.

JUDGE MCCARTHY: Would these flexible modes be characteristic of the structure of a particular solar panel or a particular other piece of equipment extending from the body of the satellite?

MR. EWERS: A person of ordinary skill in the art would know that these panels would have different frequencies on which they would typically oscillate. And this is a really broad spectrum. But part of the spectrum is known by a person of ordinary skill in the art as the part which deals with the low frequencies and the most energetic of these low frequencies.

And the indication, although it was previously discussed during prosecution, the Markley reference talks about these frequency spectrums and the choice of one bandwidth of the whole frequency spectrum. One would know -- this is, again, a general thing and there is given an example by the Examiner to illustrate these different frequencies of a PC pipe which I could compare to this pen again.

Although I have to admit that this example of the Examiner shows that he misunderstood the invention, but I can point this out later and just come back to your question.

Yes, this pen or solar panel would have a spectrum of different frequencies on which it could oscillate. And this invention focused on the lowest frequencies on which it could oscillate, and the most energetic frequencies are these lowest frequencies on which it could oscillate.

And as I said, the Markley reference is an indication that a person of ordinary skill in the art would differentiate between these areas. So lowest frequencies -- especially the lowest frequencies of this oscillation -- can be other frequencies of this frequency band which are not the lowest, which are in the middle of this spectrum.

JUDGE KERINS: Counsel, how do we for a given satellite, which is what we've claimed here, how do we know what the flexible modes are by your definition?

MR. EWERS: Okay. As I said, they are different -- there is a frequency band that can be different causes which cause the appendages to oscillate in different frequency bands.

And the invention deals with the fact that on the body of the satellite, you have thrusters or other elements which produce disturbances which produce torque because when you use the thrusters to move the satellite, then disturbances are created. And these disturbances are transmitted from the body to the solar panels.

And this creates, as described in the specification, these really low frequencies which have high energy. Contrary to this, in the Heiberg reference which is cited, the disturbances are not created in the body of the satellite but instead Heiberg deals with a completely different problem, which is unrelated to this because the disturbances are created in the solar panels.

The solar panels have a firmer stress, and that is why they crack. And this can be a completely different frequency band there. There are other forces involved in this. And these disturbances are transmitted through the body.

Whereas in our invention the disturbances are created by the thrusters and transmitted to the solar panels, and that is why Applicants or Appellants in this have found that this is really important to eliminate the disturbances in the lower frequency band, which are created by the thrusters.

JUDGE KERINS: Counsel, where do we see in claim 8, which is what we'll first discuss here, I guess.

MR. EWERS: Yes.

JUDGE KERINS: Where do we see that you're talking about only frequencies in the extendable members or extension members that are transmitted from the body to those members? Where is that in the claim?

MR. EWERS: First of all, the frequency band I was talking about is in the last variant. You can find it there. You have a control system which comprises an attitude control loop including, and that is now the feature or limitation, the corrector such that the bandwidth of the loop contains the lowest and most energetic frequency -- frequencies of the flexible modes of the allocated members. Yeah, that is basically talking about these lowest frequencies, most energetic frequencies.

JUDGE KERINS: Is what Heiberg describes in the thermal exposure, thermal environment, is that not a flexible mode?

MR. EWERS: It is -- under this definition, which we have in the Specification, that it refers to the lowest frequencies, it would not fall under this definition flexible mode being the lowest frequencies and the lowest amplitudes.

JUDGE KERINS: How do we know that that is not the lowest frequency and the highest amplitude that that satellite is going to experience?

MR. EWERS: Well, the problem here is I would like to step back to answer your question a little bit to approach this problem. If you have a control loop as is discussed here in general matter, then you know that the bandwidth of this control loop cannot cover the whole spectrum, cannot cover, let's say, all lower frequencies, all higher frequencies, everything. That is known in the art.

Even if you would limit it to a wrong area, then you could amplify disturbances outside this bandwidth. This is known in the art too.

So basically, Heiberg does not disclose anything about where exactly the frequencies need to be found. So just discloses that there can be oscillations of a certain frequency in this panel, and then this needs to be eliminated by the control loop.

So the whole question is where to find this bandwidth in the whole spectrum.

So the question is, does Heiberg teach the lowest frequencies then? Is this included or disclosed by Heiberg?

But Heiberg first does not discuss the question of bandwidth. Yeah, it discusses the emanation of one frequency. It does not discuss where to find this disturbance and the frequency band. And this brings me to the problem of inherency because the Examiner admits that Heiberg is silent about the exact frequency band. Heiberg just says eliminating disturbances based on frequencies.

And to show -- and then he says that it is inherent because otherwise the system would not work, it would not cover the whole frequency band of disturbances. As I said, there can be disturbances in the lower frequencies; there can be disturbances in the higher frequencies based on the fact that inherency cannot be established by probabilities and possibilities.

Yeah, it is possible that Heiberg might work in lower frequencies but who knows. That is not enough to show that these frequencies are inherent.

JUDGE MCCARTHY: Counsel, is it possible to have more than one attitude regulation loop or more than one control system of this sort to cover different bandwidths or different type of stimuli?

MR. EWERS: To be honest, I don't know if it is possible. In our invention, only one control loop is claimed and, yeah, I have to check.

JUDGE MCCARTHY: So then this control loop apart from handling the particular type of stimulus as described in the specification would also have to control other stimuli that might affect the attitude of the satellite?

MR. EWERS: I mean, this particular control loop system is done or is used to eliminate these particular disturbances which are created as I described by -- these thrusters transfer these disturbances to the panels and get these panels oscillated.

It is not created to eliminate disturbances as a result of these cracks, for example, as Heiberg teaches. This is a certain frequency band which is important.

And this has to do with the size of the satellite as well. And this is described in the specification as well. If you have growing bigger satellites and longer antennas or solar panels, then you more and more face these problems with the lower frequencies and the high energies. That is why you have to compensate, which you might not have to do -- might not have had to do in the past with small satellites, but this is pure speculation.

The question here is, I think coming back to the point, is this frequency band of low frequencies inherent in Heiberg or not? Because Heiberg does not explicitly teach this frequency band in which you find the lowest frequencies with the most energy.

JUDGE MCCARTHY: Well, what I'm looking for, Counsel, very simply is why is the Examiner wrong in saying that you would have to correct for these lower frequencies in order to control the attitude of the satellite?

MR. EWERS: Beg your pardon. Can you repeat the question?

JUDGE MCCARTHY: Why is the Examiner wrong in saying that an attitude-correction system would have to include both the higher frequency

modes and these lower frequency, higher energy flexible modes in order to correct the control of the attitude of the satellite?

MR. EWERS: The problem here with all these control loop systems is you have to -- there are filters involved, for example, attitude filters. And you have to create a certain filter for a certain bandwidth in which it should operate. And you cannot just simply for all frequencies which you define as disturbances create a filter or something. So you have to focus on what you want to eliminate.

And here in this invention, we want to eliminate a particular disturbance. A particular disturbance, which as I described, is created by these causes. And this particular disturbance needs a particular control loop.

And in this control loop, a particular corrector -- and that is the main problem to create this particular corrector, and first of all to recognize the problem, that there is a problem with these lowest low frequencies which have at least a high energy.

If I don't recognize the system, I would not adjust these filters to this frequency band. I would recognize maybe the frequencies which result from the crack, and then I will focus on this and I will try to eliminate. But I cannot eliminate all possible disturbances which might exist for the satellite.

JUDGE KERINS: Counsel, for a given satellite, is there a lower limit to the frequencies such that you would even know whether you were covering the lowest frequencies?

MR. EWERS: To be honest, I don't know if there is a lower limit because the lowest frequencies is really broadly claimed. There is no limit claimed of these lower frequencies.

So what it means is that based on this problem which needs to be solved, a person of ordinary skill in the art would say okay for this satellite system, taking into consideration the whole spectrum, this spectrum, this part of the lowest frequencies, but of course, it depends from the satellite. So you cannot just say there is a fixed end for all satellites. For example, if it stops or something.

JUDGE MCCARTHY: As a practical matter, though, you would have to have a lower frequency limit on the bandwidth for your controller?

MR. EWERS: Well, you will always have a limit because of bandwidth. There are two limits -- the bandwidth starts somewhere and it ends somewhere. So from this perspective, yes, you would always have two limits, a lower limit and an upper limit of this bandwidth which you control.

JUDGE KERINS: Counsel, in the Heiberg patent where he discusses the prior art, we have the one mode where he says thermal exposure creates oscillations.
Suppose we say that is the only flexible mode for that satellite. Then Heiberg's control system would cover the lowest and most energetic frequencies because that is the only flexible mode in that satellite.

MR. EWERS: I have to disagree with you because as I explained earlier, there is no system which has only one flexible mode frequency. It is known in the art that we are talking about a frequency band. And just as a simple example -- and that is why I think the Examiner is wrong with this pipe –

JUDGE KERINS: Counsel, if we know there is a frequency band for flexible modes, then there must be a lower limit.

MR. EWERS: Yes. But we are talking about this bandwidth, to put it at the lower end of this frequency spectrum. And this needs to be accomplished. So we are not -- maybe I misunderstood your question, but we are not talking about a certain frequency which we can establish.
So we are talking about a lot of frequencies on which this panel can oscillate. And then we want to get the lower end of it because this is important with respect to the causes.

JUDGE KERINS: Well, what other flexible modes are there in the Heiberg satellite that he discusses in the prior art?

MR. EWERS: Well, Heiberg -- that is what I mentioned. Heiberg does not really address this problem of flexible modes as we discuss in the specification. What Heiberg does is -- first of all, Heiberg cites this embodiment. This is prior art what the Examiner cites from Heiberg.
Heiberg is concerned with an arm, a moving part of the satellite which changes the position. And as a result of this position, it changes -- the disturbing frequencies are changed, and he wants to eliminate these changing frequencies. And what he did is he calculates the movement. First, the angle of this change of this arm, and then based on this, he calculates possible frequencies and disturbances and tries to eliminate these moving disturbances.
But again, this -- and this was an issue during prosecution, which part of Heiberg the Examiner refers to. And he clearly says he refers to the background section, not to this moving part. But even if we are talking about this moving part, there is a figure –

JUDGE KERINS: Counsel, I'm actually more interested in the background section.

MR. EWERS: Okay. Going back to the background. The background clearly tells us only the fact that if there is one frequency known, that this frequency can be eliminated. There is nothing about the bandwidth of this control loop which necessarily exists yet, but it is nothing about the bandwidth, where to adjust the bandwidth, and there is nothing about these lower frequencies or whatever.

So Heiberg tries to show that there is a control loop which one recognizes one frequency which can eliminate the disturbances as a result of these frequencies.

JUDGE KERINS: Counsel, doesn't that depend on what we regard as the flexible modes of the satellite? That was the point I was trying to make earlier. That is, if that is the only flexible mode of that satellite, then its control system would have a bandwidth or at least cover the frequency of that flexible mode.

MR. EWERS: Yes. But the assumption that this is the flexible mode is not correct because -- first of all, it is not one mode but flexible modes. And it talks about frequencies as plural and not one frequency, whereas Heiberg talks about one frequency and not about frequencies.

And then again, it is just a matter of knowledge of a person of ordinary skill in the art coming back to this. This panel would not oscillate -- if this would be a panel -- at one frequency would never oscillate. You would always find oscillations of different frequencies.

And then you can pick the resonance frequency, such as one frequency, but you always have a spectrum of frequencies. This is well known in the art.

So even if you were trying to identify this one frequency as flexible modes, it would not work because flexible modes indicates there are more than one

frequency involved, and this indicates it is kind of a spectrum.

JUDGE MCCARTHY: Then would your lowest and most energetic frequencies be spikes in the spectrum of frequencies? How would you then determine what the lowest and most energetic frequencies are?

MR. EWERS: If you mean spikes by --

JUDGE MCCARTHY: Spikes in the spectrum where you have a greater sensitivity.

MR. EWERS: It would identify these frequencies but you would not identify only one frequency; you would identify more than one frequency. Just as you see in -- let me see -- figure 4.

JUDGE MCCARTHY: So the lowest and most energetic frequencies themselves are a band of frequencies?

MR. EWERS: These are frequencies, yeah.

JUDGE HORNER: Doesn't "lowest" imply a single frequency? The lowest?

MR. EWERS: No. This implies frequencies. That is why we are talking about the frequency band bandwidth.

JUDGE KERINS: How many then?

MR. EWERS: Well, this is open. There is no specification that it should be 1, 2 or 3. So it depends. But that is why I said frequency band or bandwidth. This is an area of frequencies which are possible.

JUDGE HORNER: But only one frequency can be the lowest. Then the other ones are not as low.

MR. EWERS: But it is not talking about the lowest frequency. If you -- the most -- lowest and most energetic frequencies.

JUDGE KERINS: So would that cover everything except the highest, the very highest?

MR. EWERS: Well, this covers a bandwidth in which a person of ordinary skill in the art would understand as the lowest frequencies of this satellite system.

JUDGE KERINS: So something comparable to what is caused by the fuel slosh?

MR. EWERS: Well, the fuel slosh causes -- it is the slosh that is at the end which causes these disturbances. Because -- as I said, because of this fuel slosh, the disturbances are transferred from the body to the panel, yeah. The starting causes, for example.

JUDGE KERINS: Is that one of the lowest and most energetic in every satellite?

MR. EWERS: It is not the fuel slosh itself.

JUDGE KERINS: I understand. The oscillations caused by the fuel slosh, does that create the lowest and most energetic?

MR. EWERS: Yeah. That is coming to this point exactly. This goes -- as a result of these fuel sloshes, it should create these lowest and most energetic frequencies.

JUDGE MCCARTHY: And this frequency spectrum would be a characteristic of the structure of a particular appendage?

MR. EWERS: I mean, it could be different for a different satellite. That is why you cannot really define it as for all satellites.

JUDGE MCCARTHY: But the lowest and most energetic frequencies would be something that can be determined from the structure and would not be dependent on a particular stimulus?

MR. EWERS: It depends on both because, again, the body itself has different resonance frequencies. The question is, which frequencies of these frequencies do induce or stimulate -- I don't know how to put it in words -- by this disturbance or by this -- by the thrusters?

It is the same with this, and this comes to this point. The Examiner gives this example with the pipe, shaking it. So I am creating this. I am stimulating this pen to, I don't know, oscillate with a certain frequency. If there would be a thruster here, then this would be completely different stimulation, and I would stimulate different frequencies.

This is -- if you have a bridge, and this is the same example -- cars are going over this bridge. I hope that I am not departing too much from this but just to transfer the idea -- there are different stimulus which could result in an oscillation of a bridge, for example. Maybe you can imagine it.

And then you have different frequencies. There are harmful frequencies. Other frequencies are not harmful but it still oscillates. The same with the panels.

So the harmful oscillations here, which needs to be eliminated, are the oscillations which are stimulated by the thrusters. Let's put it this way. But the panels themselves have frequencies on which they naturally oscillate.

The question is, which part of the frequency spectrum would stimulate? And this would show you the difference to Heiberg because there is different sources -- if there is a tension in this thing and it cracks, then it might stimulate other frequencies, higher frequencies. It might transfer more energy or less energy because energy which is transferred to stimulate these frequencies is also affected.

JUDGE MCCARTHY: How then could we be sure that the frequency band that Heiberg is trying to correct doesn't overlap the frequency band of the lowest and most energetic frequencies of the flexible modes?

MR. EWERS: I mean, the question is as follows: I understand the inherency argument. The Examiner has to show if it is inherent that this frequency band must be included in Heiberg. So Heiberg must cover this area. Otherwise, it is not inherent.

If it is possible that it overlaps or that it includes, that is not enough to show inherency. And this is what I tried to explain earlier.

So yeah, Heiberg is -- can -- it is unclear where he tries to find this bandwidth, but Heiberg -- it is a 102 rejection, so Heiberg has to teach at least inherently that the lowest frequency that this band -- frequency band is chosen must be in the control loop. That the Heiberg reference -- or the Heiberg controller works.

It could work for another frequency band. Fine. But it would eliminate disturbances of these cracks, which are different than the disturbances which we discussed with respect to the thrusters.

So even overlapping it -- I mean, it does not necessarily mean that these parts must be included. This is the point I want to make. Because the argument -- the only argument the Examiner presented here is that if these frequency bands, the lowest and most energetic frequencies, are not included, then Heiberg would not work.

That means they must be included. And my statement is that is incorrect because as we see, Heiberg does not define a frequency band. Just a certain frequency -- there must be disturbances in this certain frequency and that it would work. This is what the statement says. That is why it is not inherent.

Does that answer your question?

JUDGE KERINS: Counsel, if we take the breadth of your claim and it says the lowest and most energetic frequencies, you can't tell us whether that covers half of the possible bandwidth of all oscillation frequencies or everything except the very highest possible one. We've got a very broad claim here.

MR. EWERS: Correct. But I think it is not necessary to define half of the frequency spectrum or two-thirds or something.

Another example that came to my mind, if you would have a frequency spectrum of a prism of light, you would see blue -- I don't know where it starts. Different colors. You would say the lowest frequencies -- this is a question of how a person of ordinary skill in the art would define it.

They would say, okay, this is part of the spectrum which I define as the lowest most energetic frequencies. So this might be the bluer part, and I have to focus on this part.

So it is not a question of if it is somewhere, but a person would go there and would say, okay, this is the frequency band with which we are concerned and we want to eliminate the disturbances there.

Did this answer your question?

JUDGE KERINS: I believe so. But it is your point that if we take the prism, for an example, if we start at the blue end and say that is the lowest --

MR. EWERS: I don't know if the blue is the --

JUDGE KERINS: I agree. But we're not going to go all the way up into orange just short of red.

MR. EWERS: Yeah. So we take -- exactly. So we take this area which a person of ordinary skill in the art would define for this particular type of satellites. Let's put them in parentheses the blue area.

JUDGE HORNER: I think we've run over a little bit on our time.

MR. EWERS: I have to apologize for this. I was excited to discuss this.

JUDGE MCCARTHY: May I ask one more question?

JUDGE HORNER: Yes.

JUDGE MCCARTHY: Counsel, are you saying, then, that the statement in your specification on page 5 between, I believe, lines 9 and 14 is a definition of flexible modes as the term is used in the claims?

MR. EWERS: Yes.

JUDGE MCCARTHY: Okay. That is it.

JUDGE HORNER: Great. We have no further questions.

MR. EWERS: Thank you, Your Honors, for taking your time and for discussing the case.

JUDGE HORNER: Thank you.

(Whereupon, the proceedings at 10:08 a.m. were concluded.)